

- NOTES:
1. DIMS IN INCHES
2. QTY: 1

TITLE:
BALL MANIPULATOR TOTAL ASSEMBLY

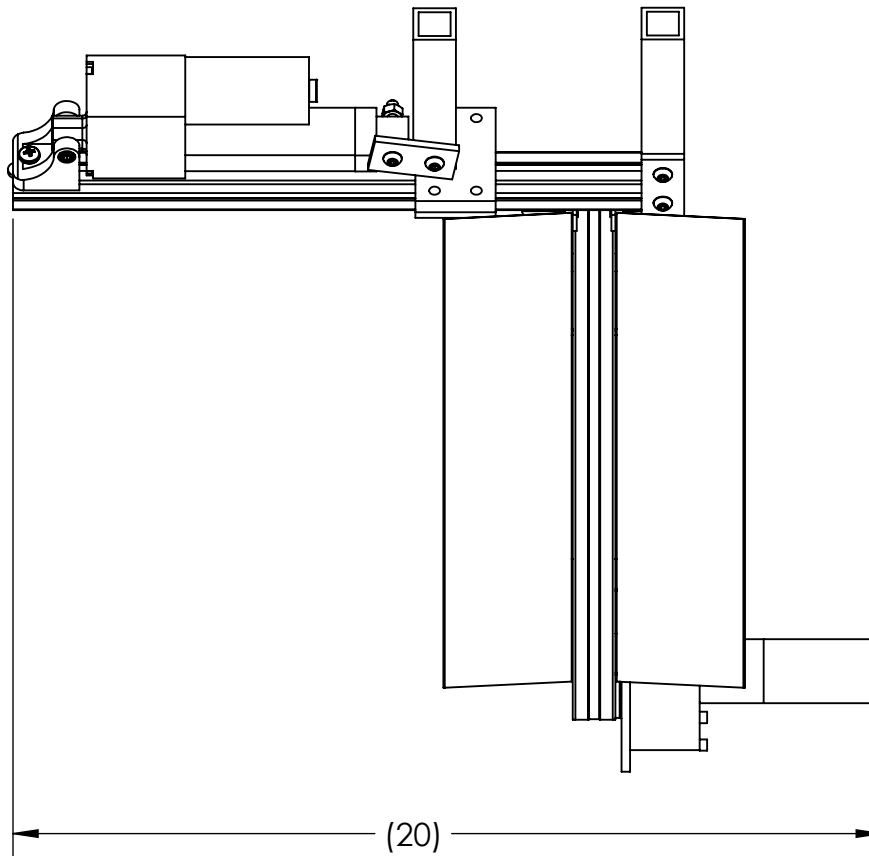
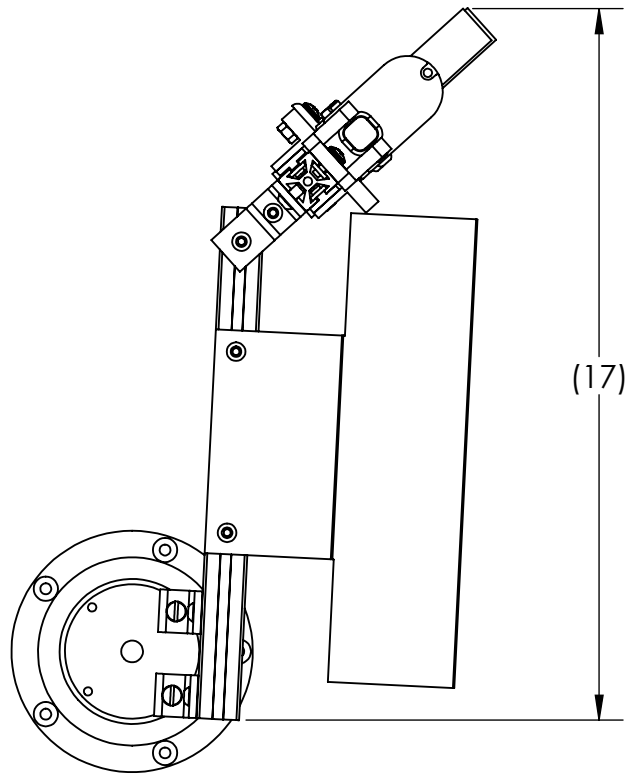
DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

DIMENSION TYPE	TOLERANCE UNLESS NOTED		
	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	± 0.050	± 0.020	± 0.005
ANGULAR	± 5	± 2	± 0.5

SIZE	DWG. NO.	REV
A	EML2322L-A-009	A

SCALE: 1:2.5	SHEET 1 OF 18
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- NOTES:
 1. DIMS IN INCHES
 2. QTY: 1

TITLE:
 BALL MANIPULATOR TOTAL ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED				DESIGNED ALLEN ZHOU		
DIMENSION TYPE	PLACES IN DIMENSION			SIZE A	DWG. NO. EML2322L-A-009	REV A
	0.0	0.00	0.000			
LOCATIONAL	±0.050	±0.020	±0.005			
ANGULAR	±5	±2	±0.5	SCALE: 1:4.5		SHEET 2 OF 18

SCALE: 1:4.5

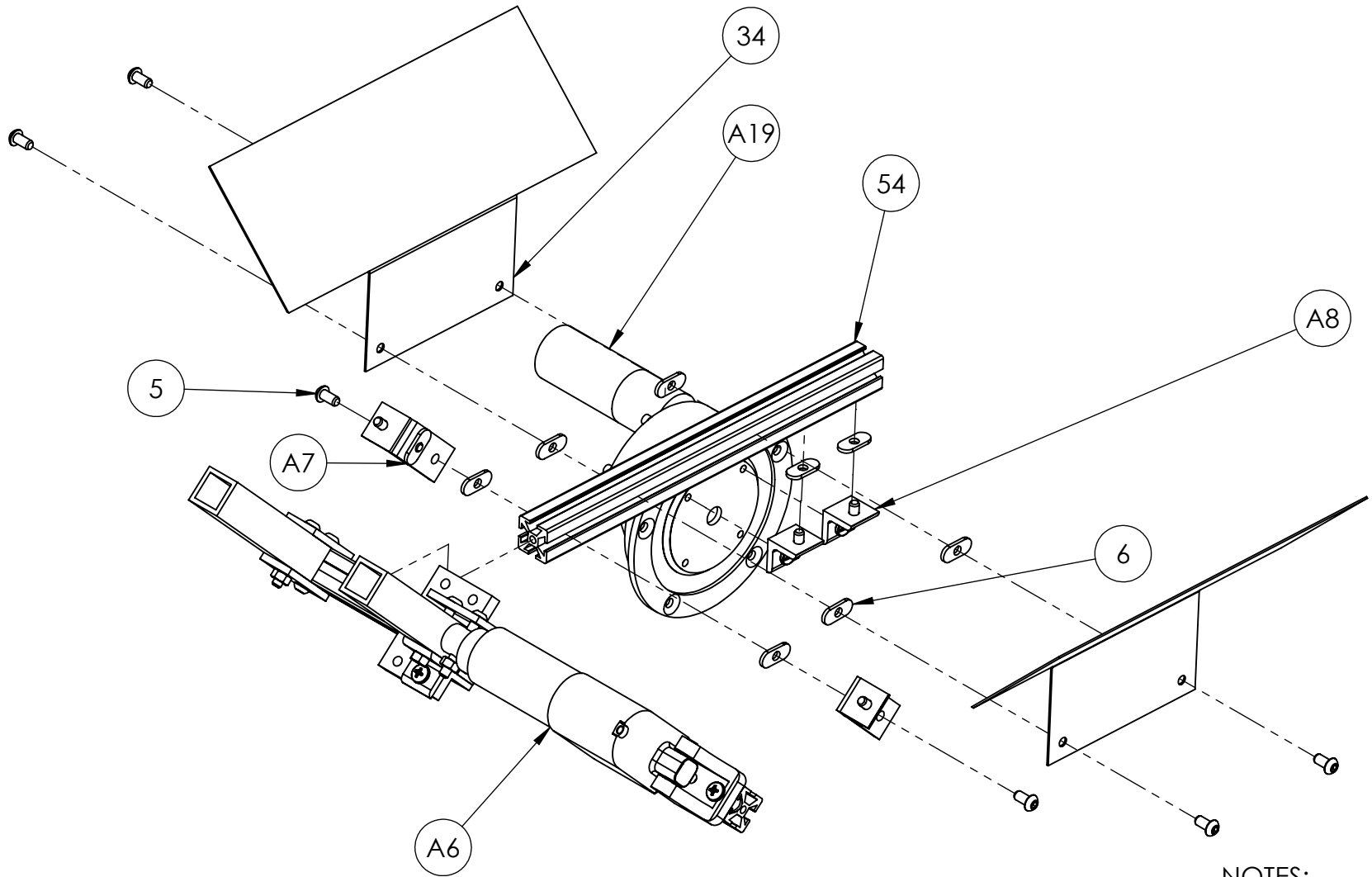
SHEET 2 OF 18

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	6
6	EML2322L-0006	1/4-20 T-NUT	8
34	EML2322L-0034	BALL MANIPULATOR CHANNEL	2
54	EML2322L-0054	80/20 EXTRUSION - 12 in	1
A6	EML2322L-A-006	CLAW ASSEMBLY	1
A7	EML2322L-A-007	CLAW MOUNT	2
A8	EML2322L-A-008	GLOBE MOTOR BRACKET ASSEMBLY	2
A19	EML2322L-A-019	4.5 RPM GLOBE MOTOR	1

NOTES:
 1. DIMS IN INCHES
 2. QTY: 1

TITLE: BALL MANIPULATOR TOTAL ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-009		A
SCALE: 1:8		SHEET 3 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
 1. DIMS IN INCHES
 2. QTY: 1

TITLE:
 BALL MANIPULATOR TOTAL ASSEMBLY

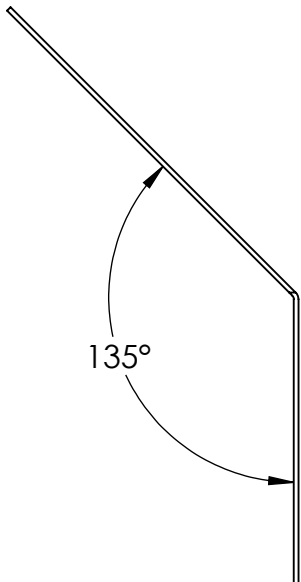
DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

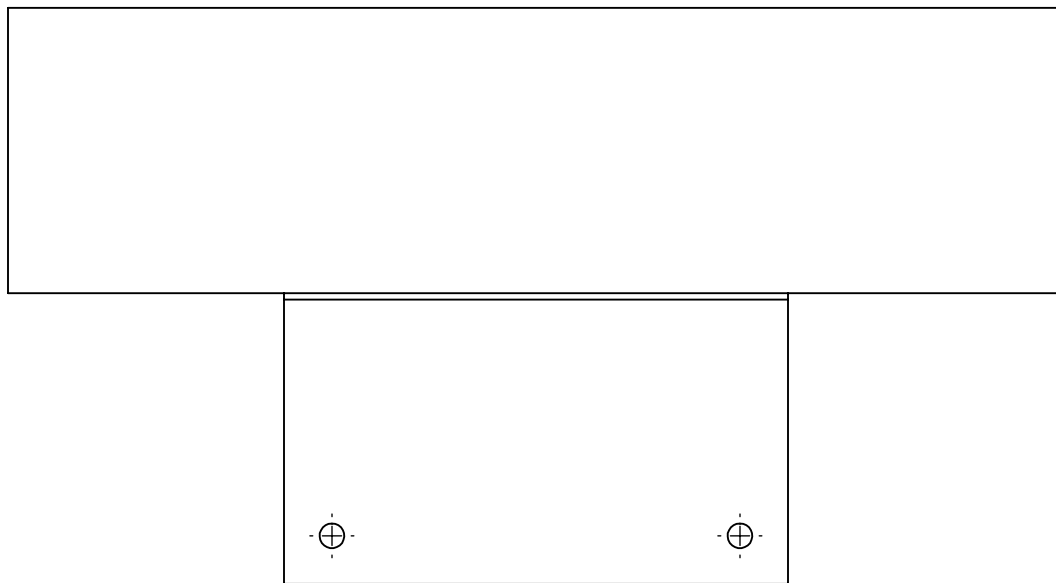
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	± 0.050	± 0.020	± 0.005
ANGULAR	± 5	± 2	± 0.5

SIZE	DWG. NO.	REV
A	EML2322L-A-009	A

SCALE: 1:3.5	SHEET 4 OF 18
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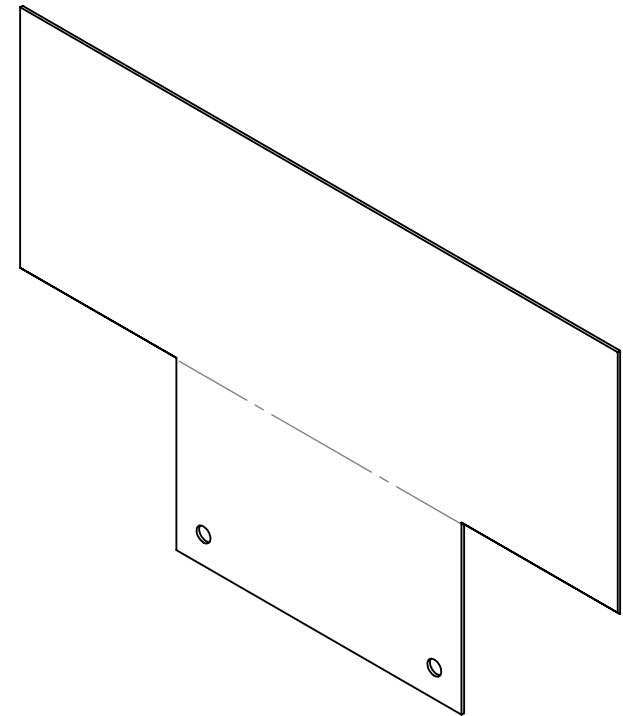
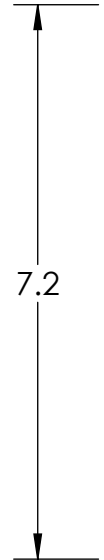
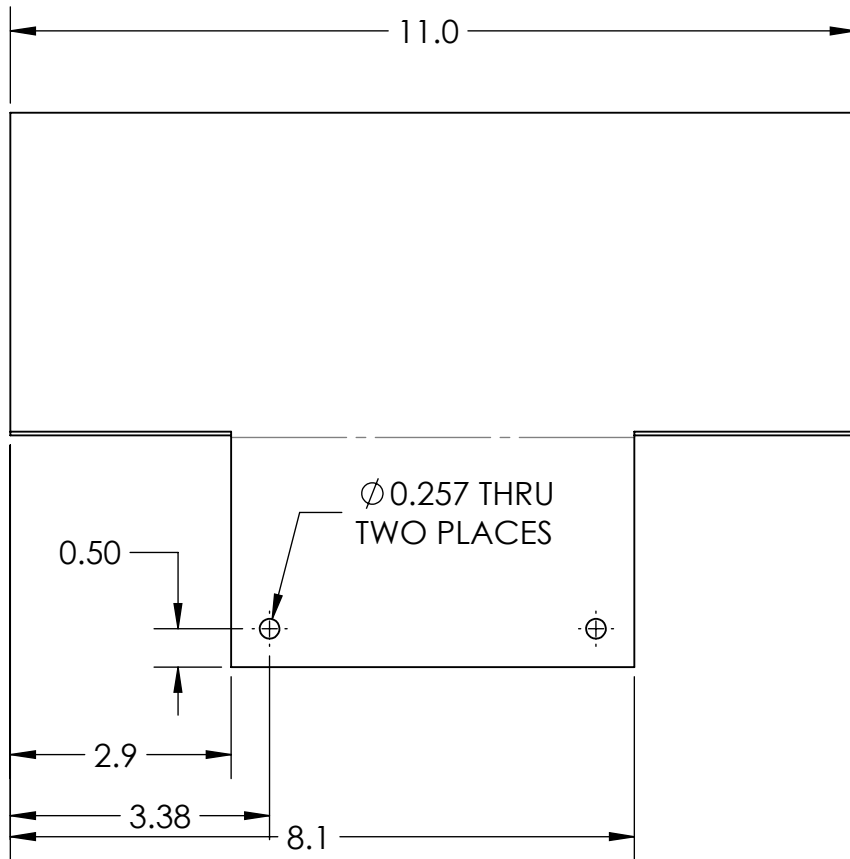


FOLDED VIEW



- NOTES:
1. QTY: 1
 2. MATL: 20GA STEEL
 3. DIMS IN INCHES
 4. BREAK ALL EDGES
 5. UNFINISHED SURFACES

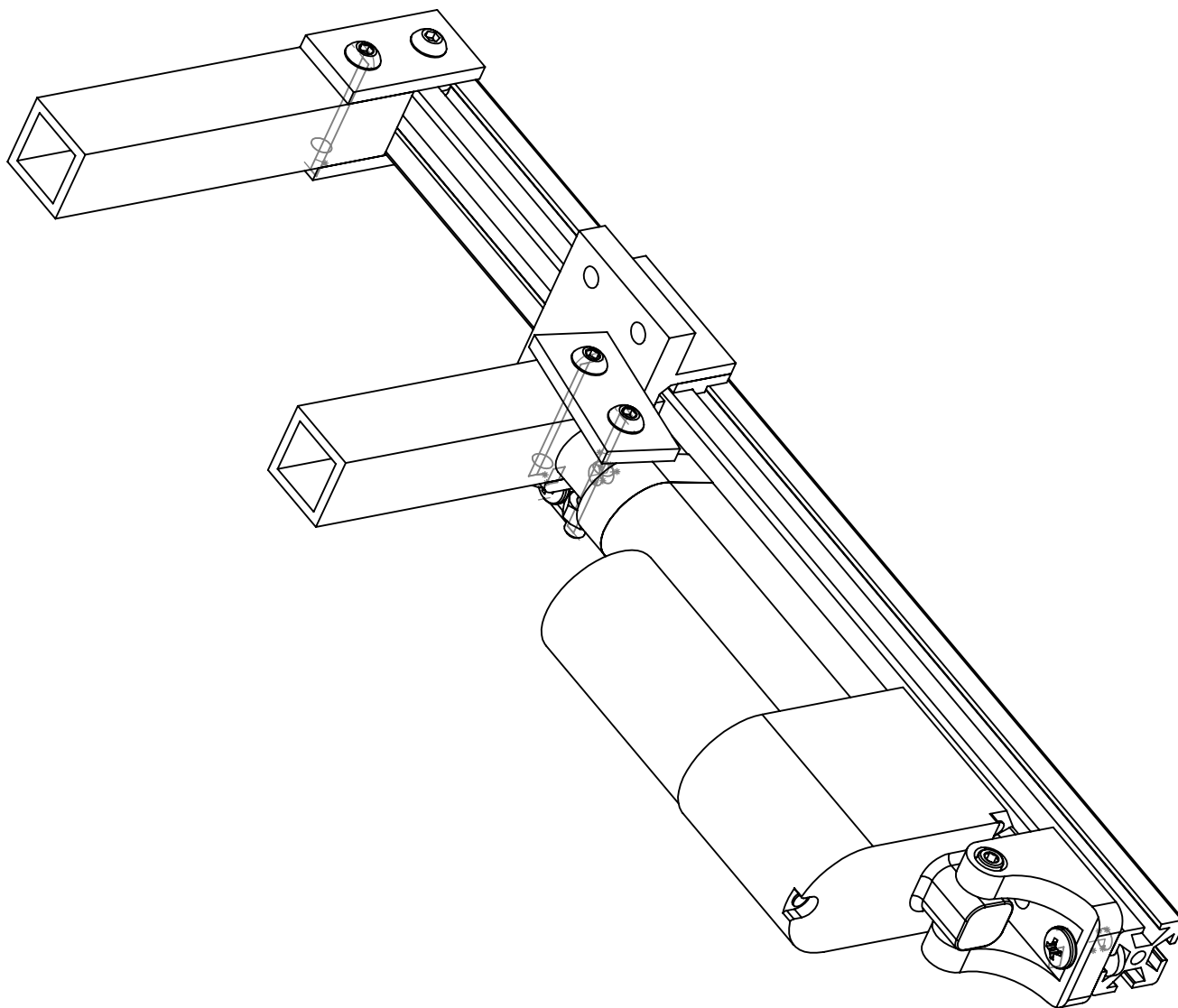
TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-0034	A
ANGULAR DIMS	±5	±2		SCALE: 1:2		SHEET 5 OF 18



UNFOLDED VIEW

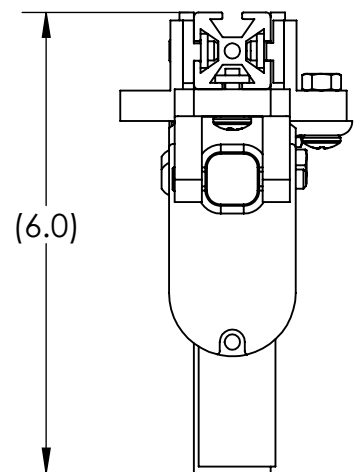
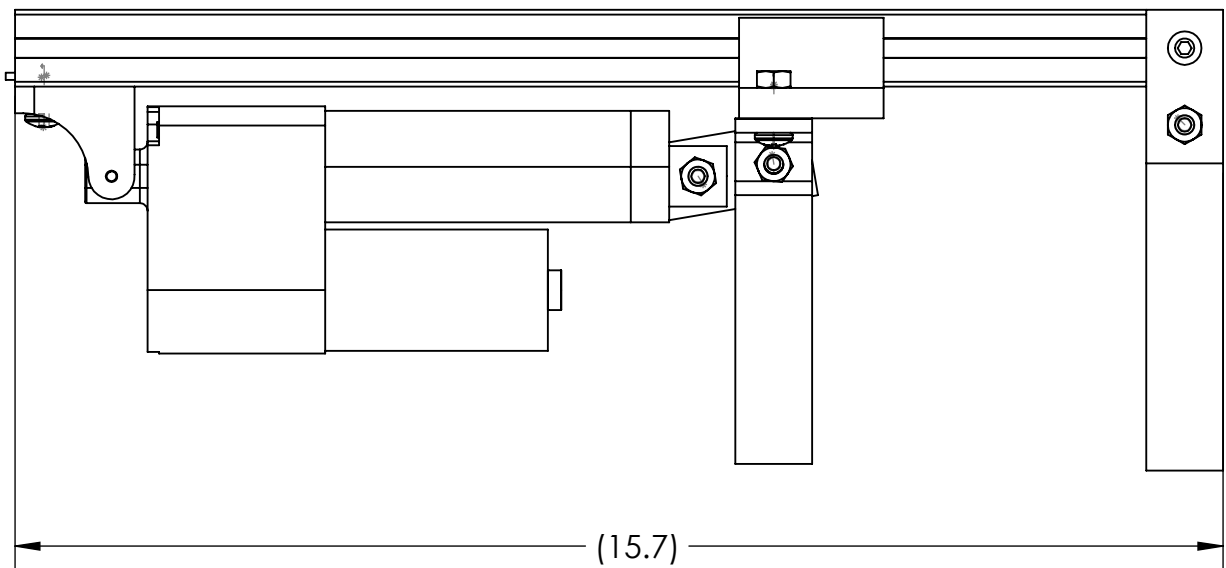
- NOTES:
- 1.QTY: 1
 - 2.MATL: 20GA STEEL
 - 3.DIMS IN INCHES
 - 4.BREAK ALL EDGES
 - 5.FINISH NO SURFACE

TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-034	A
ANGULAR DIMS	±5	±2		SCALE: 1:2.5		SHEET 6 OF 18



NOTES:
1. DIMS IN INCHES
2. QTY: 1

TITLE:				CLAW ASSEMBLY			
DRAWN				ALLEN ZHOU			
DESIGNED				ALLEN ZHOU			
SIZE		DWG. NO.			REV		
A		EML2322L-A-006			A		
SCALE: 1:8					SHEET 7 OF 18		



- NOTES:
 1. QTY: 1
 2. DIMS IN INCHES

TITLE:			
CLAW ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.	REV	
A	EML2322L-A-006	A	
SCALE: 1:2.5		SHEET 8 OF 18	

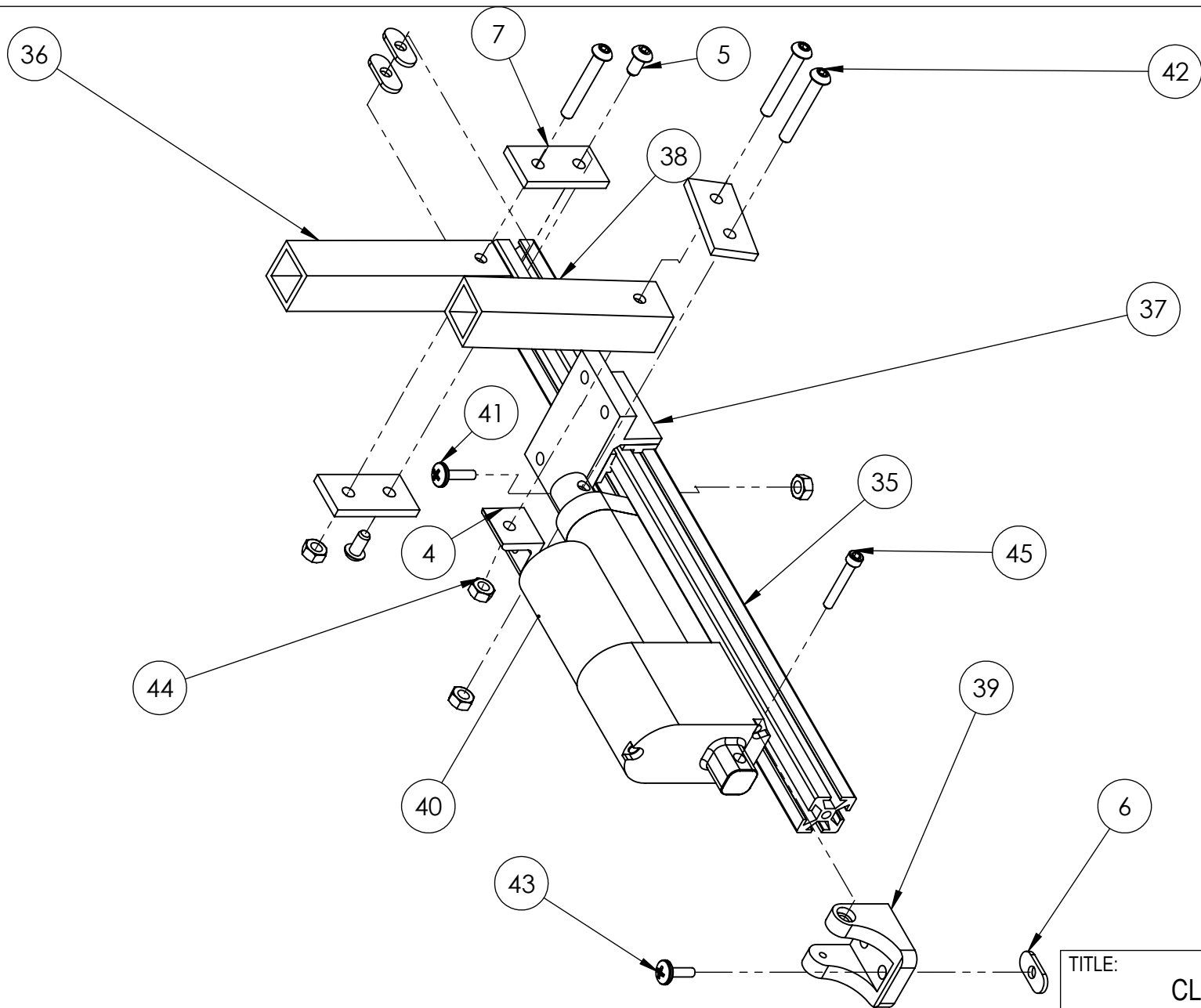
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	EML2322L-0004	80/20 90 DEG ANGLE BRACKET	1
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	2
6	EML2322L-0006	1/4-20 T-NUT	3
7	EML2322L-0007	80/20 STRAIGHT BRACKET	3
35	EML2322L-0035	80/20 EXTRUSION - 15.7 in	1
36	EML2322L-0036	BALL MANIPULATOR CLAW - 5 in	1
37	EML2322L-0037	80/20 LINEAR SLIDE	1
38	EML2322L-0038	BALL MANIPULATOR CLAW - 4.5 in	1
39	EML2322L-0039	10-24 LINEAR ACTUATOR MOUNT	1
40	EML2322L-0040	30 IPM SPAL LINEAR ACTUATOR (2in)	1
41	EML2322L-0041	1/4-20 x 3/4 in PAN HEAD SCREW	1
42	EML2322L-0042	1/4-20 x 1.75 in BUTTON HEAD SCREW	3
43	EML2322L-0043	1/4-20 x 5/8 in PAN HEAD SCREW	1
44	EML2322L-0044	1/4-20 in HEX NUT	5
45	EML2322L-0045	10-24 x 1.25 in SOCKET HEAD - PARTIAL THREAD	1

NOTES:
1. QTY: 1
2. ALL DIMS IN INCHES

TITLE: CLAW ASSEMBLY			
DRAWN ALLEN ZHOU		DESIGNED ALLEN ZHOU	
SIZE A	DWG. NO. EML2322L-A-006		REV A
	SCALE: 1:8		SHEET 9 OF 18

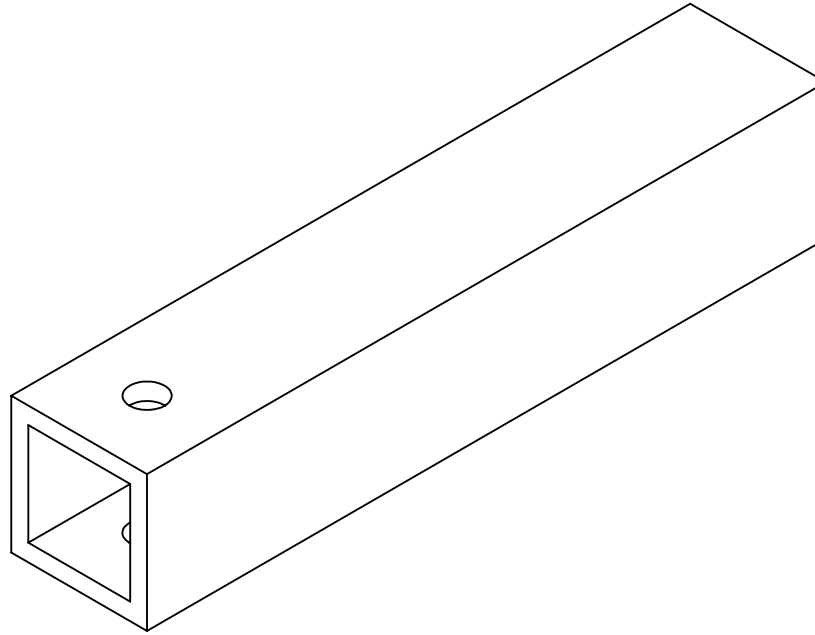
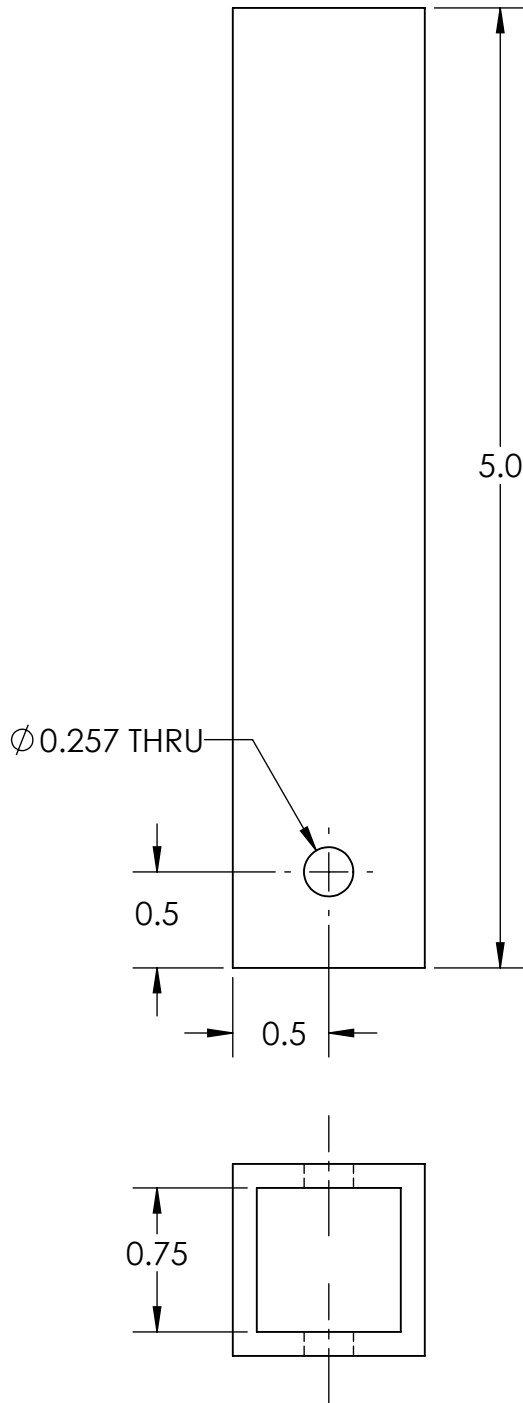
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
1. QTY: 1
2. ALL DIMS IN INCHES

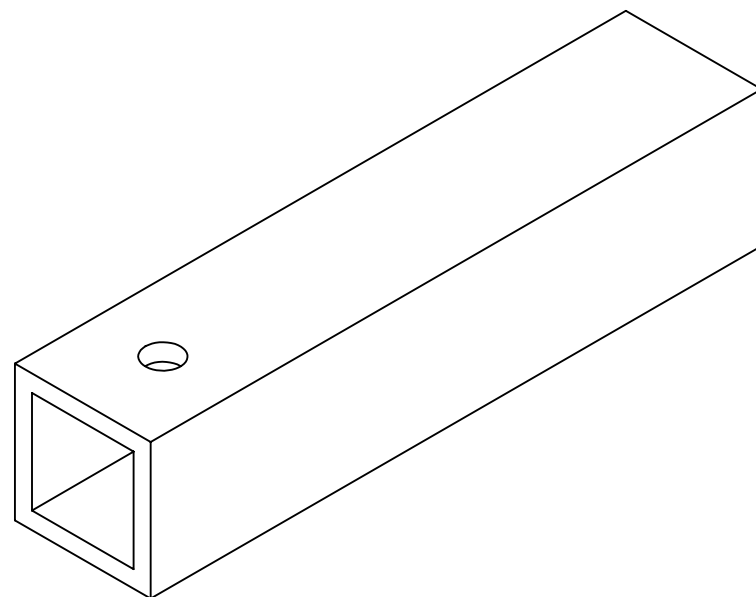
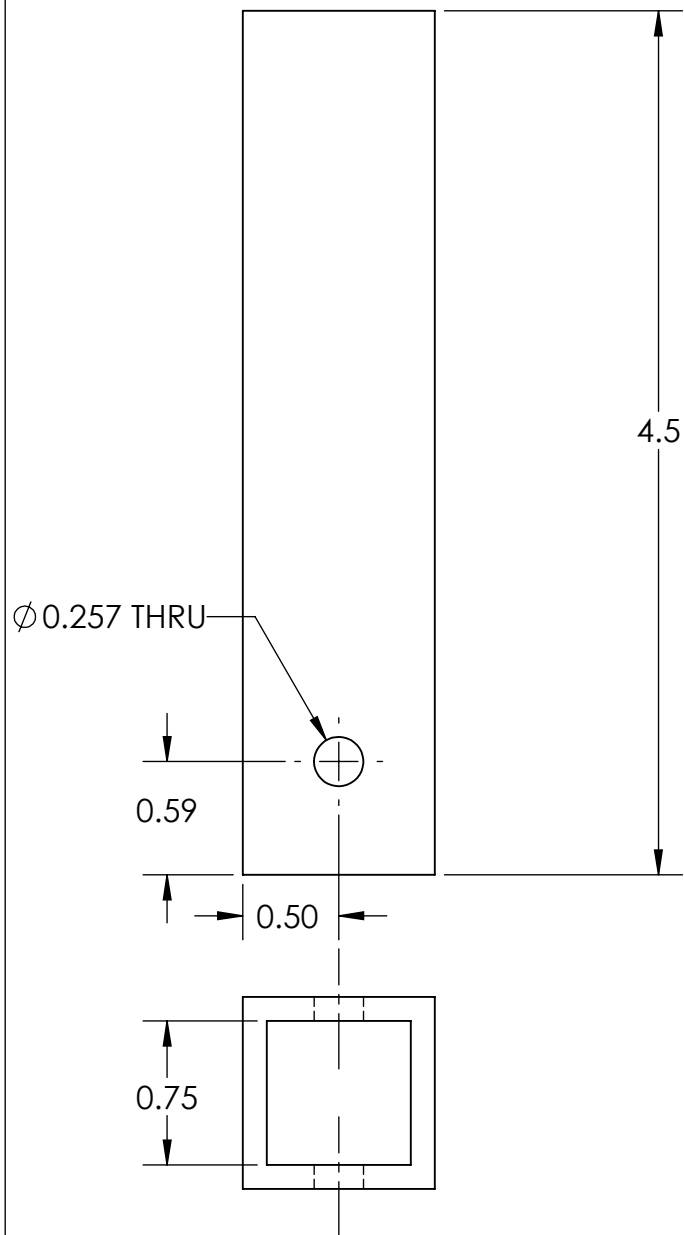
TITLE:				CLAW ASSEMBLY		
DRAWN				ALLEN ZHOU		
DESIGNED				ALLEN ZHOU		
SIZE		DWG. NO.			REV	
A		EML2322L-A-006			A	
SCALE:1:3					SHEET 10 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



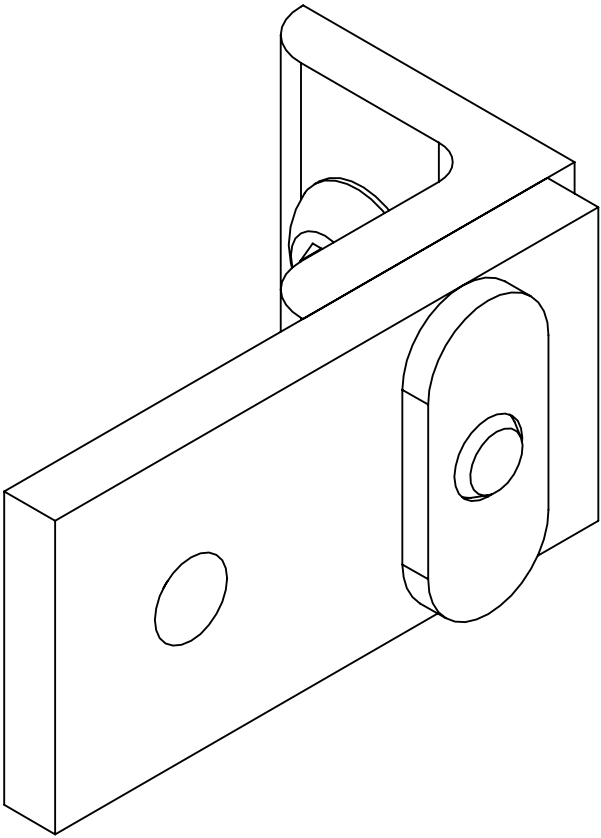
- NOTES:
1. QTY: 1
 2. MATL: ALUMINUM
 3. FINISH NO SURFACES
 4. DIMS IN INCHES
 5. BREAK ALL EDGES

TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CLAW - 5 in		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING	± 0.050	± 0.020	± 0.005	DESIGNED	ALLEN ZHOU	
CUT OFF (SAW, BURN, SHEAR)	± 0.1	± 0.060		SIZE	DWG. NO.	REV
WELDING	± 0.1	± 0.060		A	EML2322L-0036	A
ANGULAR DIMS	± 5	± 2	± 0.5	SCALE: 1:2		SHEET 11 OF 18



- NOTES:
1. QTY: 1
 2. MATL: ALUMINUM
 3. DIMS IN INCHES
 4. FINISH NO SURFACES
 5. BREAK ALL EDGES

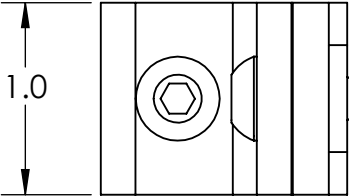
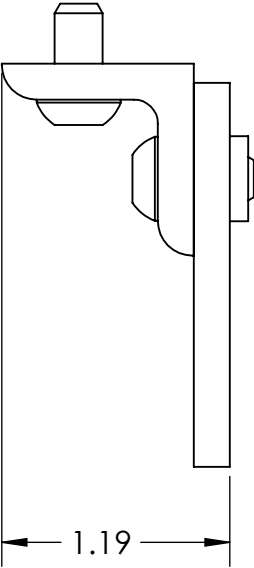
TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CLAW - 4.5 in		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING	± 0.050	± 0.020	± 0.005	DESIGNED	ALLEN ZHOU	
CUT OFF (SAW, BURN, SHEAR)	± 0.1	± 0.060		SIZE	DWG. NO.	REV
WELDING	± 0.1	± 0.060		A	EML2322L-0038	A
ANGULAR DIMS	± 5	± 2	± 0.5	SCALE: 1:2		SHEET 12 OF 18



NOTES:
1. QTY: 2
2. DIMS IN INCHES

TITLE:		CLAW MOUNT	
DRAWN	ALLEN ZHOU		
DESIGNED	ALLEN ZHOU		
SIZE	DWG. NO.		REV
A	EML2322L-A-007		A
SCALE: 1:1			SHEET 13 OF 18

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

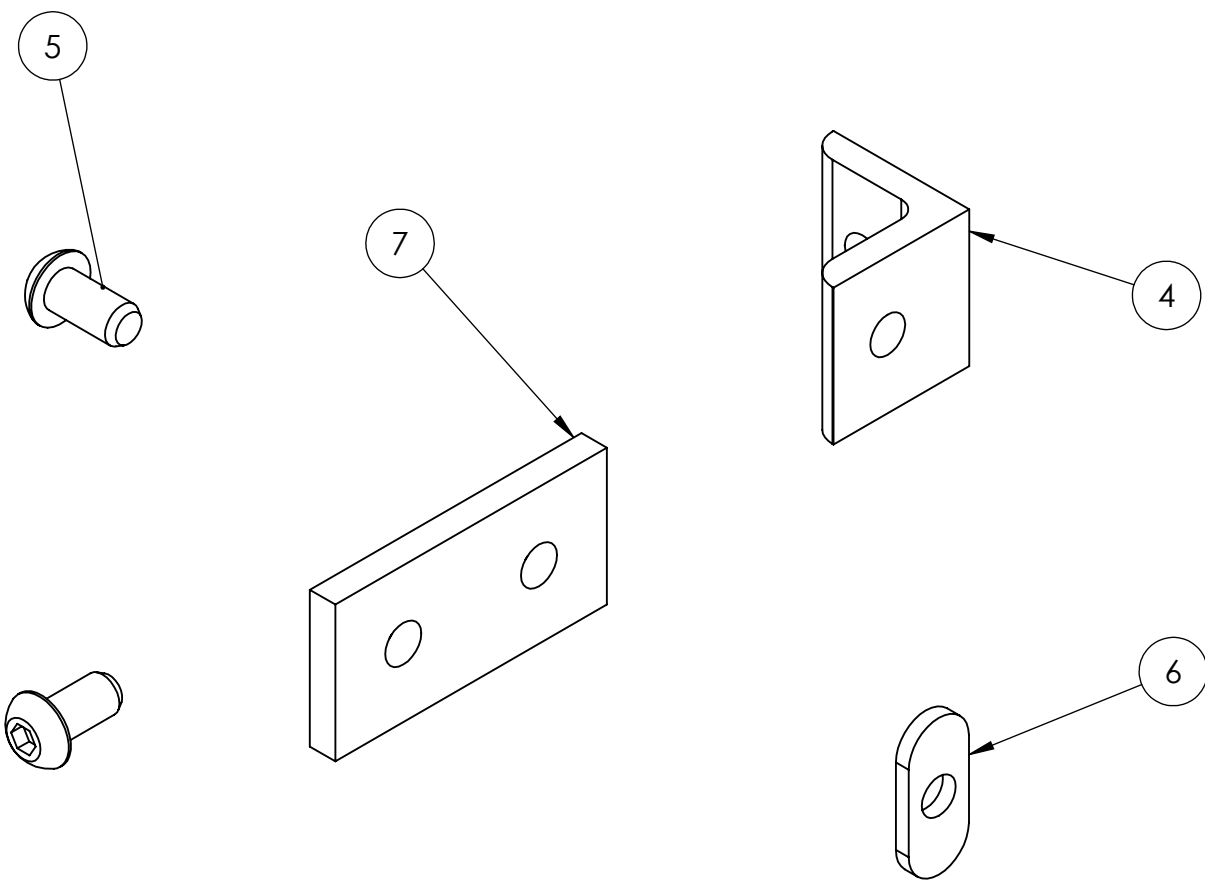


NOTES:
1. QTY: 2
2. DIMS IN INCHES

TITLE:				CLAW MOUNT		
DRAWN				ALLEN ZHOU		
DESIGNED				ALLEN ZHOU		
SIZE	DWG. NO.		REV			
A	EML2322L-A-007		A			
SCALE: 1:1				SHEET 14 OF 18		

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

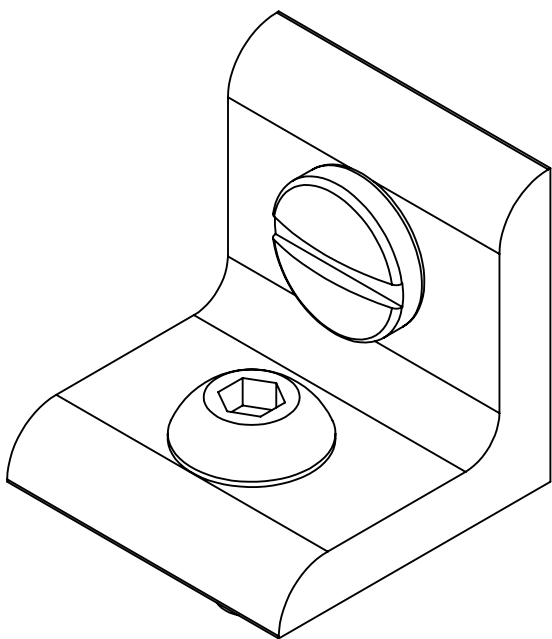
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	EML2322L-0004	80/20 90 DEG ANGLE BRACKET	1
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	2
6	EML2322L-0006	1/4-20 T-NUT	1
7	EML2322L-0007	80/20 STRAIGHT BRACKET	1



NOTES:
 1. DIMS IN INCHES
 2. QTY: 2

TITLE:			
CLAW MOUNT			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-007		A
SCALE: 1:4		SHEET 15 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



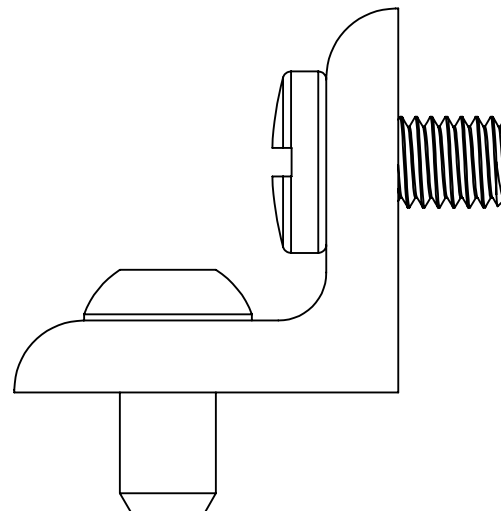
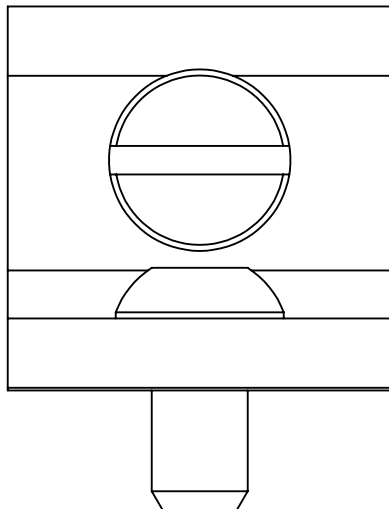
NOTES:
1. DIMS IN INCHES
2. QTY: 2

TITLE:
GLOBE MOTOR BRACKET ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED				DESIGNED ALLEN ZHOU		
DIMENSION TYPE	PLACES IN DIMENSION			SIZE A	DWG. NO. EML2322L-A-008	REV A
	0.0	0.00	0.000			
LOCATIONAL	±0.050	±0.020	±0.005			
ANGULAR	±5	±2	±0.5	SCALE: 1:2		SHEET 16 OF 18



- NOTES:
 1. QTY: 2
 2. DIMS IN INCHES

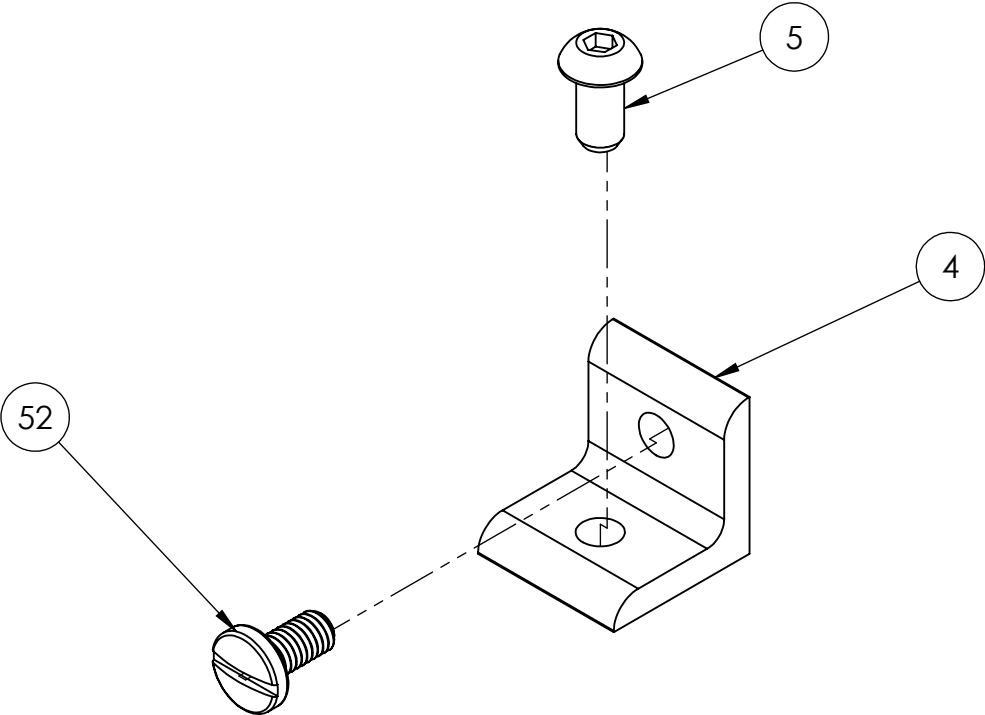
TITLE:
 GLOBE MOTOR BRACKET ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED				DESIGNED ALLEN ZHOU		
DIMENSION TYPE	PLACES IN DIMENSION			SIZE	DWG. NO. EML2322L-A-008	REV
	0.0	0.00	0.000	A		A
LOCATIONAL	±0.050	±0.020	±0.005	A	EML2322L-A-008	A
ANGULAR	±5	±2	±0.5			
SCALE: 2:1						

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	EML2322L-0004	80/20 90 DEG ANGLE BRACKET	1
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	1
52	EML2322L-0052	M6 x 1 - 12 mm PAN HEAD SCREW FOR GM	1



NOTES:
 1. DIMS IN INCHES
 2. QTY: 2

TITLE:
 GLOBE MOTOR BRACKET ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

SIZE	DWG. NO.	REV
A	EML2322L-A-008	A

SCALE: 1:2 SHEET 18 OF 18